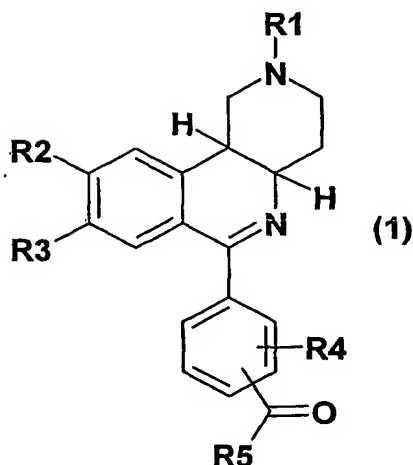


Patent claims

1. Compounds of formula 1



in which

R1 is 1-4C-alkyl,

R2 is hydroxyl, 1-4C-alkoxy, 3-7C-cycloalkoxy, 3-7C-cycloalkylmethoxy, or 1-4C-alkoxy which is completely or predominantly substituted by fluorine,

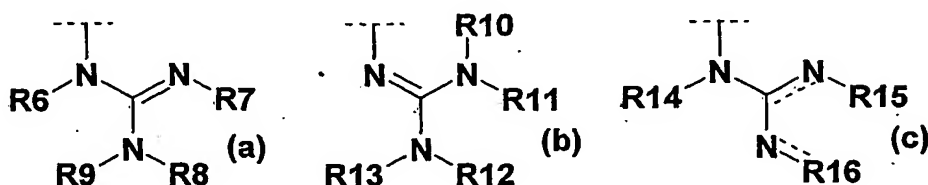
R3 is hydroxyl, 1-4C-alkoxy, 3-7C-cycloalkoxy, 3-7C-cycloalkylmethoxy, or 1-4C-alkoxy which is completely or predominantly substituted by fluorine,

or in which

R2 and R3 together are a 1-2C-alkylenedioxy group,

R4 is hydrogen, halogen, nitro, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,

R5 is a radical of the formulae (a), (b) or (c)



in which

if R5 is a radical of the formula (a),

either

R6, R7, R8 and R9 independently of one another are hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl, cyano, hydroxy-2-4C-alkyl, 1-4C-alkoxy-2-4C-alkyl or R26, with the proviso that at least one of R6, R7, R8 and R9 is 1-4C-alkoxy-2-4C-alkyl,

or

R6 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl, hydroxy-2-4C-alkyl, 1-4C-alkoxy-2-4C-alkyl or R26,

R7 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl, hydroxy-2-4C-alkyl, 1-4C-alkoxy-2-4C-alkyl or R26, and

R8 and R9, together and including the nitrogen atom to which both are bonded, are a piperazin-1-yl radical substituted in 4-position by R17, a azocan-1-yl, azonan-1-yl, azecan-1-yl, tetrahydroisoquinolin-2-yl, tetrahydro-6,7-dimethoxyisoquinolin-2-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, 2,6-dimethyl-morpholin-4-yl, 2,6-dimethyl-piperidin-1-yl, 4-benzyl-piperidin-1-yl, thiomorpholin-4-yl or 1H-1,2,4-triazol-1-yl radical,

or

R6 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl, hydroxy-2-4C-alkyl, 1-4C-alkoxy-2-4C-alkyl or R26,

R7 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl, hydroxy-2-4C-alkyl, 1-4C-alkoxy-2-4C-alkyl or R26,

R8 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl, hydroxy-2-4C-alkyl, 1-4C-alkoxy-2-4C-alkyl or R26, and

R9 is cyano, Aryl1, R26, naphthyl, phenyl, phenyl substituted by R18 and/or R19, phenyl-1-4C-alkyl or phenyl-1-4C-alkyl substituted in the phenyl moiety by R20 and/or R21,

in which

if R5 is a radical of the formula (b),

either

R10 and R11 independently of one another are hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl, hydroxy-2-4C-alkyl, 1-4C-alkoxy-2-4C-alkyl or R26, and

R12 and R13, together and including the nitrogen atom to which both are bonded, are a piperazin-1-yl radical substituted in 4-position by R17, a azocan-1-yl, azonan-1-yl, azecan-1-yl, tetrahydroisoquinolin-2-yl, tetrahydro-6,7-dimethoxyisoquinolin-2-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, 2,6-dimethyl-morpholin-4-yl, 2,6-dimethyl-piperidin-1-yl, 4-benzyl-piperidin-1-yl, thiomorpholin-4-yl or 1H-1,2,4-triazol-1-yl radical,

or

R10 and R11, together and including the nitrogen atom to which both are bonded, are a 2,6-dimethyl-morpholin-4-yl, 2,6-dimethyl-piperidin-1-yl, 4-benzyl-piperidin-1-yl or thiomorpholin-4-yl radical, and

R12 and R13, together and including the nitrogen atom to which both are bonded, are a pyrrolidin-1-yl, piperidin-1-yl, hexahydroazepin-1-yl, morpholin-4-yl, 4-(1-4C-alkyl)-piperazin-1-yl, 2,6-dimethyl-morpholin-4-yl, 2,6-dimethyl-piperidin-1-yl, 4-benzyl-piperidin-1-yl or thiomorpholin-4-yl radical,

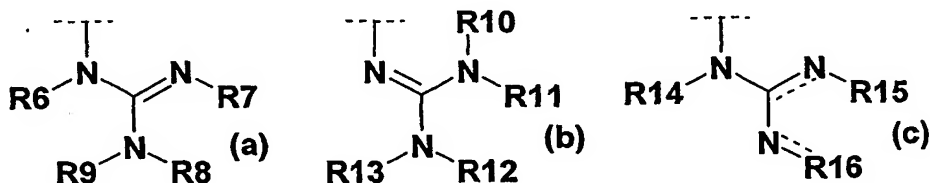
in which

if R5 is a radical of the formula (c),

- R14 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl, hydroxy-2-4C-alkyl, 1-4C-alkoxy-2-4C-alkyl or R26, and
- R15 and R16, together and with inclusion of the N-C(-)-N structure to which they are bonded are Aryl2,
- Aryl1 is 4-methylthiazol-2-yl, benzimidazol-2-yl, 5-nitrobenzimidazol-2-yl, 5-chlorobenzimidazol-2-yl, 5-methylbenzimidazol-2-yl, 4-methylquinazolin-2-yl, benzothiazol-2-yl, benzoxazol-2-yl or pyrimidin-2-yl,
- Aryl2 is 1-methyl-4-oxo-4,5-dihydro-1H-imidazol-2-yl, imidazol-2-yl, 4,5-dicyano-imidazol-2-yl, 4-methyl-imidazol-2-yl, 4-ethyl-benzimidazol-2-yl, 4-acetyl-imidazol-2-yl, 1H-[1,2,4]triazol-3-yl, benzimidazol-2-yl, 1-methyl-benzimidazol-2-yl, 1-ethyl-benzimidazol-2-yl, 5,6-dimethyl-benzimidazol-2-yl, purin-8-yl, 6-amino-7-methyl-7H-purine-8-yl, 1,6-dimethylimidazo[4,5-b]pyridin-2-yl, 1,5,6-trimethylimidazo[4,5-b]pyridin-2-yl, 1,3-dimethyl-3,7-dihydro-1H-purine-2,6-dione-8-yl, 7-ethyl-3-methyl-3,7-dihydro-purine-2,6-dione-8-yl, 1,3,7-trimethyl-3,7-dihydro-purine-2,6-dione-8-yl, thiadiazolyl, 1,4-dihydrotetrazol-5-yl, 2H-[1,2,4]triazol-3-yl, 1,3-dihydrobenzimidazol-5-yl, 1H-tetrazol-5-yl, pyrimidin-2-yl or 4,6-dimethyl-pyrimidin-2-yl,
- R17 is formyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl, 1-4C-alkoxycarbonyl-1-4C-alkyl, 1-4C-alkylcarbonyl, hydroxy-2-4C-alkyl, 1-4C-alkoxy-2-4C-alkyl, hydroxy-2-4C-alkoxy-2-4C-alkyl, 1-4C-alkoxy-2-4C-alkoxy-2-4C-alkyl, phenyl, phenyl substituted by R22 and/or R23, [benzo(1,3)dioxol]-5-ylmethyl, phenyl-1-4C-alkyl or phenyl-1-4C-alkyl substituted in the phenyl moiety by R24 and/or R25,
- R18 is halogen, nitro, carboxyl, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,
- R19 is halogen, 1-4C-alkyl or 1-4C-alkoxy,
- R20 is halogen, nitro, carboxyl, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,
- R21 is halogen, 1-4C-alkyl or 1-4C-alkoxy,
- R22 is halogen, nitro, carboxyl, 1-4C-alkyl, 1-4C-alkylcarbonyl, trifluoromethyl or 1-4C-alkoxy,
- R23 is halogen, 1-4C-alkyl or 1-4C-alkoxy,
- R24 is halogen, nitro, carboxyl, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,
- R25 is halogen, 1-4C-alkyl or 1-4C-alkoxy,
- R26 is R27(R28)N-2-4C-alkyl wherein
- R27 and R28, together and including the nitrogen atom to which both are bonded, are a pyrrolidin-1-yl, piperidin-1-yl, piperazin-1-yl, 4-(1-4C-alkyl-)piperazin-1-yl, azepan-1-yl, azocan-1-yl, azonan-1-yl, azecan-1-yl, tetrahydroisoquinolin-2-yl, tetrahydro-6,7-dimethoxyisoquinolin-2-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, morpholin-4-yl, 2,6-dimethyl-morpholin-4-yl, 2,6-dimethyl-piperidin-1-yl, 4-benzyl-piperidin-1-yl, thiomorpholin-4-yl or 1H-1,2,4-triazol-1-yl radical,
- the salts of these compounds, as well as the N-oxides, enantiomers, E/Z isomers and tautomers of these compounds and their salts.

2. Compounds of formula 1 according to claim 1 in which

- R1 is 1-4C-alkyl,
 R2 is 1-4C-alkoxy, 3-6C-cycloalkoxy, 3-6C-cycloalkylmethoxy, or 1-4C-alkoxy which is completely or predominantly substituted by fluorine,
 R3 is 1-4C-alkoxy, 3-6C-cycloalkoxy, 3-6C-cycloalkylmethoxy, or 1-4C-alkoxy which is completely or predominantly substituted by fluorine,
 R4 is hydrogen, halogen, nitro, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,
 R5 is a radical of the formulae (a), (b) or (c)



in which

if R5 is a radical of the formula (a),

either

R6 is hydrogen,

R7 is hydrogen,

R8 is hydrogen, 1-4C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl or 1-4C-alkoxy-2-4C-alkyl, and

R9 is hydrogen, 1-4C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl or 1-4C-alkoxy-2-4C-alkyl, with the proviso that at least one of R8 or R9 is 1-4C-alkoxy-2-4C-alkyl,

or

R6 is hydrogen,

R7 is hydrogen, 1-4C-alkyl, 3-7C-cycloalkyl or 3-7C-cycloalkylmethyl, and

R8 and R9, together and including the nitrogen atom to which both are bonded, are a piperazin-1-yl radical substituted in 4-position by R17, a azocan-1-yl, azonan-1-yl, azecan-1-yl, tetrahydro-isoquinolin-2-yl, tetrahydro-6,7-dimethoxyisoquinolin-2-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, 2,6-dimethyl-morpholin-4-yl, 2,6-dimethyl-piperidin-1-yl, 4-benzyl-piperidin-1-yl or thiomorpholin-4-yl radical,

or

R6 is hydrogen,

R7 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl or 3-7C-cycloalkylmethyl,

R8 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl or 3-7C-cycloalkylmethyl, and

R9 is cyano, Aryl1, R26, naphthyl, phenyl, phenyl substituted by R18 and/or R19, phenyl-1-4C-alkyl or phenyl-1-4C-alkyl substituted in the phenyl moiety by R20 and/or R21,

in which

if R5 is a radical of the formula (b),

either

R10 and R11 independently of one another are hydrogen, 1-4C-alkyl, 3-7C-cycloalkyl or 3-7C-cycloalkylmethyl, and

R12 and R13, together and including the nitrogen atom to which both are bonded, are a piperazin-1-yl radical substituted in 4-position by R17, a azocan-1-yl, azonan-1-yl, azecan-1-yl, tetrahydroisoquinolin-2-yl, tetrahydro-6,7-dimethoxyisoquinolin-2-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, 2,6-dimethyl-morpholin-4-yl, 4-benzyl-piperidin-1-yl or 2,6-dimethyl-piperidin-1-yl radical,

or

R10 and R11, together and including the nitrogen atom to which both are bonded, are a 2,6-dimethyl-morpholin-4-yl, 4-benzyl-piperidin-1-yl or 2,6-dimethyl-piperidin-1-yl radical, and

R12 and R13, together and including the nitrogen atom to which both are bonded, are a pyrrolidin-1-yl, piperidin-1-yl, hexahydroazepin-1-yl, morpholin-4-yl, 4-(1-4C-alkyl)-piperazin-1-yl, 2,6-dimethyl-morpholin-4-yl, 4-benzyl-piperidinyl or 2,6-dimethyl-piperidin-1-yl radical,

in which

if R5 is a radical of the formula (c),

R14 is hydrogen, and

R15 and R16, together and with inclusion of the N-C(-)-N structure to which they are bonded are Aryl2,

Aryl1 is 4-methylthiazol-2-yl, benzimidazol-2-yl, 5-nitrobenzimidazol-2-yl, 5-chlorobenzimidazol-2-yl, 5-methylbenzimidazol-2-yl, benzothiazol-2-yl or benzoxazol-2-yl,

Aryl2 is 1-methyl-4-oxo-4,5-dihydro-1H-imidazol-2-yl, imidazol-2-yl, 4,5-dicyano-imidazol-2-yl, 4-methyl-imidazol-2-yl, 4-ethyl-benzimidazol-2-yl, 4-acetyl-imidazol-2-yl, 1H-[1,2,4]triazol-3-yl, benzimidazol-2-yl, 1-methyl-benzimidazol-2-yl, 1-ethyl-benzimidazol-2-yl, 5,6-dimethyl-benzimidazol-2-yl, purin-8-yl, 6-amino-7-methyl-7H-purine-8-yl, 1,6-dimethylimidazo[4,5-b]pyridin-2-yl, 1,5,6-trimethylimidazo[4,5-b]pyridin-2-yl, 1,3-dimethyl-3,7-dihydro-1H-purine-2,6-dione-8-yl, 7-ethyl-3-methyl-3,7-dihydro-purine-2,6-dione-8-yl, 1,3,7-trimethyl-3,7-dihydro-purine-2,6-dione-8-yl or 1H-[1,2,4]triazol-3-yl,

R17 is formyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl, 1-4C-alkoxycarbonyl-1-4C-alkyl, 1-4C-alkylcarbonyl, hydroxyethyl, 1-2C-alkoxyethyl, hydroxy-2-4C-alkoxyethyl, 1-2C-alkoxy-2-4C-alkoxyethyl, phenyl, phenyl substituted by R22 and/or R23, [benzo(1,3)dioxol]-5ylmethyl, phenyl-1-4C-alkyl or phenyl-1-4C-alkyl substituted in the phenyl moiety by R24 and/or R25,

R18 is halogen, nitro, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,

R19 is halogen, 1-4C-alkyl or 1-4C-alkoxy,

R20 is halogen, nitro, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,

R21 is halogen, 1-4C-alkyl or 1-4C-alkoxy,

R22 is halogen, nitro, 1-4C-alkyl, 1-4C-alkylcarbonyl, trifluoromethyl or 1-4C-alkoxy,

R23 is halogen, 1-4C-alkyl or 1-4C-alkoxy,

R24 is halogen, nitro, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,

R25 is halogen, 1-4C-alkyl or 1-4C-alkoxy,

R26 is R27(R28)N-2-4C-alkyl wherein

R27 and R28, together and including the nitrogen atom to which both are bonded, are a pyrrolidin-1-yl, piperidin-1-yl, piperazin-1-yl, 4-(1-4C-alkyl-)piperazin-1-yl, azepan-1-yl, azocan-1-yl, azonan-1-yl, azecan-1-yl, morpholin-4-yl or thiomorpholin-4-yl radical,

the salts of these compounds, as well as the N-oxides, enantiomers, E/Z isomers and tautomers of these compounds and their salts.

3. Compounds of formula 1 according to claim 1 in which

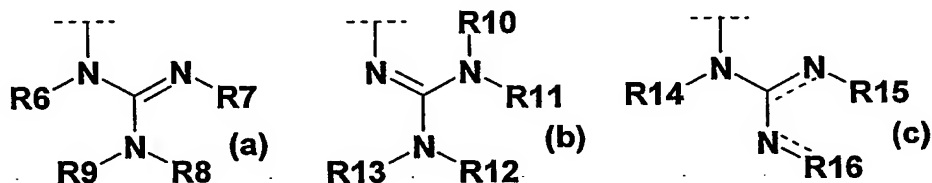
R1 is methyl,

R2 is 1-4C-alkoxy,

R3 is 1-4C-alkoxy,

R4 is hydrogen,

R5 is a radical of the formulae (a), (b) or (c)



in which

if R5 is a radical of the formula (a),

either

R6 is hydrogen,

R7 is hydrogen,

R8 is hydrogen or methoxy-2-4C-alkyl,

R9 is methoxy-2-4C-alkyl,

or

R6 is hydrogen,

R7 is hydrogen, and

R8 and R9, together and including the nitrogen atom to which both are bonded, are a piperazin-1-yl radical substituted in 4-position by R17, a tetrahydroisoquinolin-2-yl, tetrahydro-6,7-dimethoxyisoquinolin-2-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, azocan-1-yl, azonan-1-yl, azecan-1-yl, 4-benzyl-piperidin-1-yl or thiomorpholin-4-yl radical,

or

R6 is hydrogen,

R7 is hydrogen,

R8 is hydrogen, and

R9 is cyano, Aryl1, morpholin-4-ylethyl, naphthyl, phenyl, phenyl-1-2C-alkyl, 3,4-dimethoxybenzyl or 3,4-dimethoxyphenylethyl,

in which

if R5 is a radical of the formula (b),

R10 is hydrogen,

R11 is hydrogen, and

R12 and R13, together and including the nitrogen atom to which both are bonded, are a piperazin-1-yl radical substituted in 4-position by R17, a tetrahydroisoquinolin-2-yl, tetrahydro-6,7-dimethoxyisoquinolin-2-yl, 4-benzyl-piperidin-1-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, azocan-1-yl, azonan-1-yl or azecan-1-yl radical,

in which

if R5 is a radical of the formula (c),

R14 is hydrogen, and

R15 and R16, together and with inclusion of the N-C(-)-N structure to which they are bonded are Aryl2,

Aryl1 is 4-methylthiazol-2-yl, benzimidazol-2-yl or benzothiazol-2-yl,

Aryl2 is 1-methyl-4-oxo-4,5-dihydro-1H-imidazol-2-yl, imidazol-2-yl or benzimidazol-2-yl,

R17 is acetyl, (2-hydroxyethoxy)ethyl, cyclohexyl, ethoxycarbonylmethyl, phenyl, [benzo(1,3)dioxol]-5-ylmethyl, 2-methoxyphenyl, 3-trifluoromethylphenyl, 4-acetylphenyl or benzyl,

the salts of these compounds, as well as the N-oxides, enantiomers, E/Z isomers and tautomers of these compounds and their salts.

4. Compounds of formula 1 according to claim 1 in which

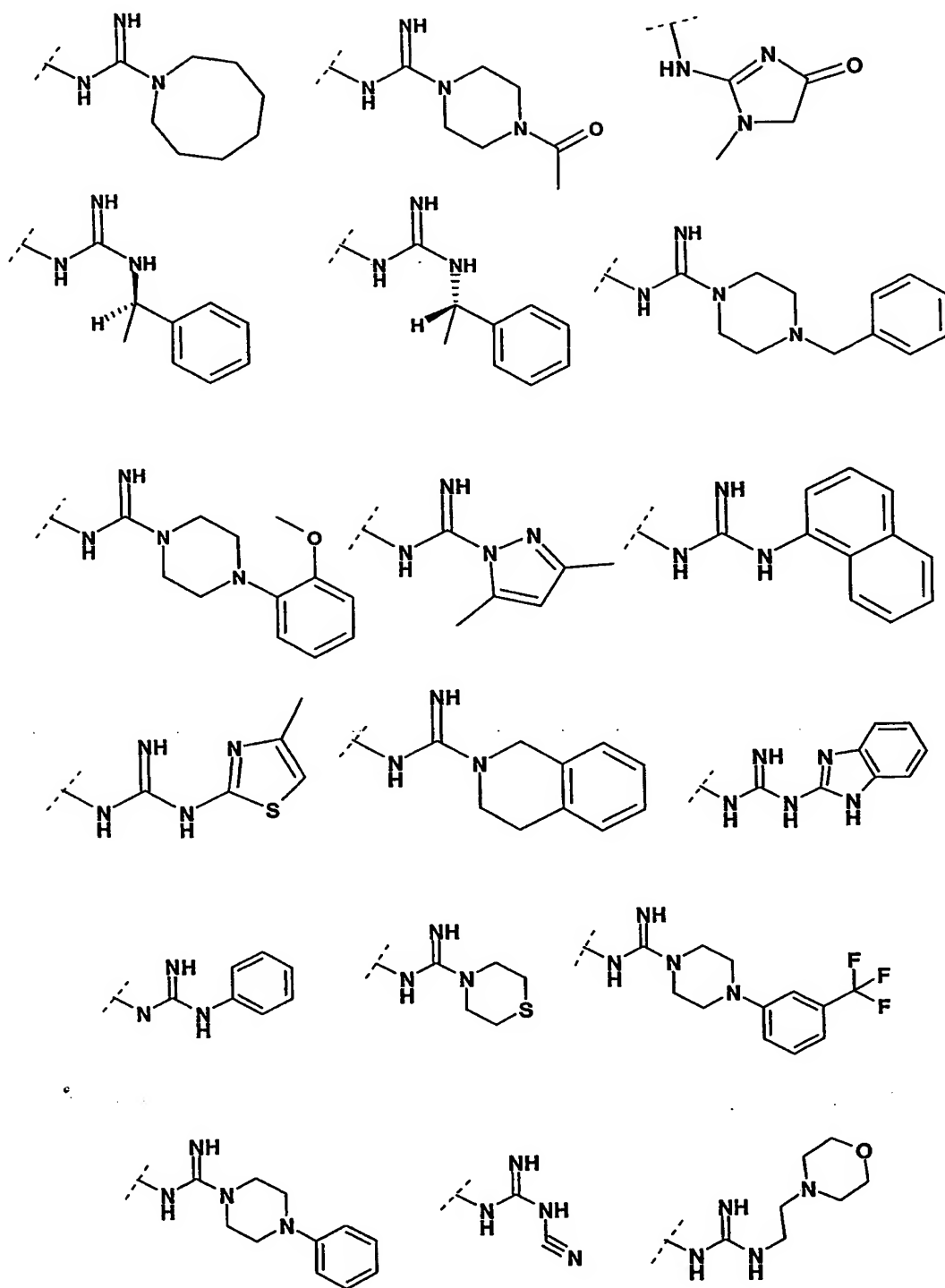
R1 is methyl,

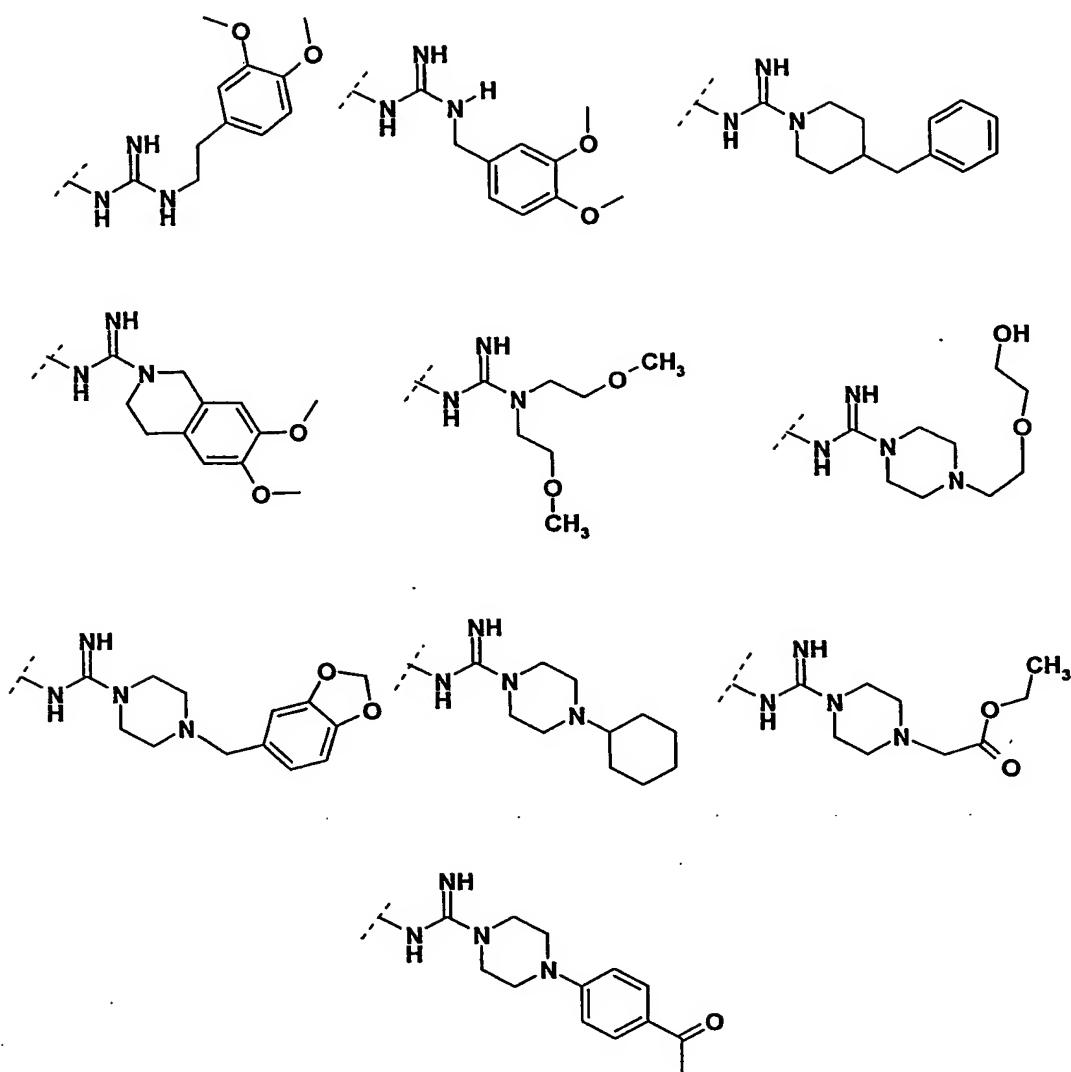
R2 is methoxy or ethoxy,

R3 is methoxy,

R4 is hydrogen,

R5 is a radical selected from





the salts of these compounds, as well as the N-oxides, enantiomers, E/Z isomers and tautomers of these compounds and their salts.

5. A compound of formula 1 according to claim 1 selected from

4-((4aR,10bS)-9-Ethoxy-8-methoxy-2-methyl-1,2,3,4,4a,10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-N-(1-methyl-4-oxo-4,5-dihydro-1H-imidazol-2-yl)-benzamide;

N-(1-Amino-1-azocan-1-yl-methylene)-4-((4aR,10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a,10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;

N-[1-(4-Acetyl-piperazin-1-yl)-1-amino-methylene]-4-((4aR,10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a,10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;

N-{1-[4-((4aR,10bS)-9-Ethoxy-8-methoxy-2-methyl-1,2,3,4,4a,10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-phenyl]-methanoyl}-N'-((R)-1-phenyl-ethyl)-guanidine;

N-{1-[4-((4aR, 10bS)-9-Ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-phenyl]-methanoyl}-N'-((S)-1-phenyl-ethyl)-guanidine;

N-[1-Amino-1-(4-benzyl-piperazin-1-yl)-methylene]-4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;

N-[1-Amino-1-[4-(2-methoxy-phenyl)-piperazin-1-yl]-methylene]-4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;

N-[1-(3,5-Dimethyl-pyrazol-1-yl)-1-imino-methyl]-4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;

N-[1-[4-((4aR, 10bS)-9-Ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-phenyl]-methanoyl]-N'-naphthalen-1-yl-guanidine;

N-[1-[4-((4aR, 10bS)-9-Ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-phenyl]-methanoyl]-N'-(4-methyl-thiazol-2-yl)-guanidine;

N-[1-(tetrahydroisoquinolin-2-yl)-1-imino-methyl]-4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;

N-(1H-benzimidazol-2-yl)-N'-[1-[4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-phenyl]-methanoyl]-guanidine;

N-[1-[4-((4aR, 10bS)-9-Ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-phenyl]-methanoyl]-N'-phenyl-guanidine;

N-(1-Amino-1-thiomorpholin-4-yl-methylene)-4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;

N-[1-Amino-1-[4-(3-trifluoromethyl-phenyl)-piperazin-1-yl]-methylene]-4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;

N-[1-Amino-1-(4-phenyl-piperazin-1-yl)-methylene]-4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;

N-[1-[4-((4aR, 10bS)-9-Ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-phenyl]-methanoyl]-N'-cyano-guanidine;

N-[1-[4-((4aR, 10bS)-9-Ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-phenyl]-methanoyl]-N'-(2-morpholin-4-yl-ethyl)-guanidine;

N-[2-(3,4-Dimethoxy-phenyl)-ethyl]-N'-[1-[4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-phenyl]-methanoyl]-guanidine;

N-(3,4-Dimethoxy-benzyl)-N'-[1-[4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-phenyl]-methanoyl]-guanidine;

N-[1-Amino-1-(4-benzyl-piperidin-1-yl)-methylene]-4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;

N-[1-Amino-1-(6,7-dimethoxy-3,4-dihydro-1H-isoquinolin-2-yl)-methylene]-4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;

N'-[1-[4-((4aR, 10bS)-9-Ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-phenyl]-methanoyl]-N,N-bis-(2-methoxy-ethyl)-guanidine;

N-(1-Amino-1-[4-[2-(2-hydroxy-ethoxy)-ethyl]-piperazin-1-yl]-methylene)-4-((4aR, 10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a, 10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;

N-[1-Amino-1-(4-benzo[1,3]dioxol-5-ylmethyl-piperazin-1-yl)-methylene]-4-((4aR,10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a,10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;
 N-[1-Amino-1-(4-cyclohexyl-piperazin-1-yl)-methylene]-4-((4aR,10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a,10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;
 [4-(1-Amino-1-[1-[4-((4aR,10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a,10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-phenyl]-methanoylimino)-methyl]-piperazin-1-yl]-acetic acid ethyl ester;
 N-{1-[4-(4-Acetyl-phenyl)-piperazin-1-yl]-1-amino-methylene}-4-((4aR,10bS)-9-ethoxy-8-methoxy-2-methyl-1,2,3,4,4a,10b-hexahydro-benzo[c][1,6]naphthyridin-6-yl)-benzamide;
 or a salt of this compound, a N-oxide, enantiomer, E/Z isomer or tautomer of this compound or a salt thereof.

6. Compounds of formula 1 according to claim 1 in which

R1 is 1-4C-alkyl,

R2 is hydroxyl, 1-4C-alkoxy, 3-7C-cycloalkoxy, 3-7C-cycloalkylmethoxy, or 1-4C-alkoxy which is completely or predominantly substituted by fluorine,

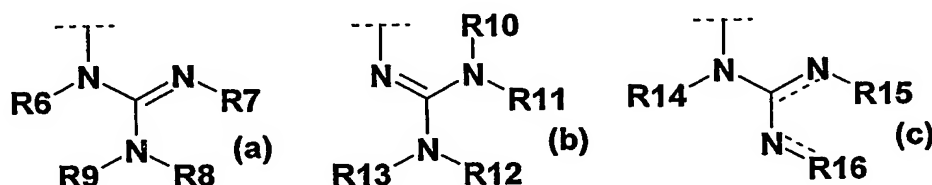
R3 is hydroxyl, 1-4C-alkoxy, 3-7C-cycloalkoxy, 3-7C-cycloalkylmethoxy, or 1-4C-alkoxy which is completely or predominantly substituted by fluorine,

or in which

R2 and R3 together are a 1-2C-alkylenedioxy group,

R4 is hydrogen, halogen, nitro, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,

R5 is a radical of the formulae (a), (b) or (c)



in which

if R5 is a radical of the formula (a),

either

R6 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl or hydroxy-2-4C-alkyl,

R7 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl or hydroxy-2-4C-alkyl, and

R8 and R9, together and including the nitrogen atom to which both are bonded, are a piperazin-1-yl radical substituted in 4-position by R17, a azocan-1-yl, azonan-1-yl, azecan-1-yl, tetrahydro-isoquinolin-2-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, 2,6-dimethyl-morpholin-4-yl, 2,6-dimethyl-piperidin-1-yl, thiomorpholin-4-yl or 1H-1,2,4-triazol-1-yl radical,

or

R6 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl or hydroxy-2-4C-alkyl,

R7 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl or hydroxy-2-4C-alkyl,

R8 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl or hydroxy-2-4C-alkyl, and
R9 is Aryl1, naphthyl, phenyl, phenyl substituted by R18 and/or R19, phenyl-1-4C-alkyl or
phenyl-1-4C-alkyl substituted in the phenyl moiety by R20 and/or R21,

in which

if R5 is a radical of the formula (b),

either

R10 and R11 independently of one another are hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl or hydroxy-2-4C-alkyl, and

R12 and R13, together and including the nitrogen atom to which both are bonded, are a piperazin-1-yl radical substituted in 4-position by R17, a azocan-1-yl, azonan-1-yl, azecan-1-yl, tetrahydroisoquinolin-2-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, 2,6-dimethyl-morpholin-4-yl, 2,6-dimethyl-piperidin-1-yl, thiomorpholin-4-yl or 1H-1,2,4-triazol-1-yl radical,

or

R10 and R11, together and including the nitrogen atom to which both are bonded, are a 2,6-dimethyl-morpholin-4-yl, 2,6-dimethyl-piperidin-1-yl or thiomorpholin-4-yl radical, and

R12 and R13, together and including the nitrogen atom to which both are bonded, are a pyrrolidin-1-yl, piperidin-1-yl, hexahydroazepin-1-yl, morpholin-4-yl, 4-(1-4C-alkyl)-piperazin-1-yl, 2,6-dimethyl-morpholin-4-yl, 2,6-dimethyl-piperidin-1-yl or thiomorpholin-4-yl radical,

in which

if R5 is a radical of the formula (c),

R14 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl, 3-7C-cycloalkylmethyl or hydroxy-2-4C-alkyl, and

R15 and R16, together and with inclusion of the N-C(-)-N structure to which they are bonded are Aryl2,

Aryl1 is 4-methylthiazol-2-yl, benzimidazol-2-yl, 5-nitrobenzimidazol-2-yl, 5-chlorobenzimidazol-2-yl, 5-methylbenzimidazol-2-yl, 4-methylquinazolin-2-yl, benzothiazol-2-yl, benzoxazol-2-yl or pyrimidin-2-yl,

Aryl2 is 1-methyl-4-oxo-4,5-dihydro-1H-imidazol-2-yl, imidazol-2-yl, 4,5-dicyano-imidazol-2-yl, 4-methyl-imidazol-2-yl, 4-ethyl-benzimidazol-2-yl, 4-acetyl-imidazol-2-yl, 1H-[1,2,4]triazol-3-yl, benzimidazol-2-yl, 1-methyl-benzimidazol-2-yl, 1-ethyl-benzimidazol-2-yl, 5,6-dimethyl-benzimidazol-2-yl, purin-8-yl, 6-amino-7-methyl-7H-purine-8-yl, 1,6-dimethylimidazo[4,5-b]pyridin-2-yl, 1,5,6-trimethylimidazo[4,5-b]pyridin-2-yl, 1,3-dimethyl-3,7-dihydro-1H-purine-2,6-dione-8-yl, 7-ethyl-3-methyl-3,7-dihydro-purine-2,6-dione-8-yl, 1,3,7-trimethyl-3,7-dihydro-purine-2,6-dione-8-yl, thiadiazolyl, 1,4-dihydratetrazol-5-yl, 2H-[1,2,4]triazol-3-yl, 1,3-dihydrobenzimidazol-5-yl, 1H-tetrazol-5-yl, pyrimidin-2-yl or 4,6-dimethyl-pyrimidin-2-yl,

R17 is formyl, 1-4C-alkylcarbonyl, 2-hydroxyethyl, phenyl, phenyl substituted by R22 and/or R23, phenyl-1-4C-alkyl or phenyl-1-4C-alkyl substituted in the phenyl moiety by R24 and/or R25,

R18 is halogen, nitro, carboxyl, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,

R19 is halogen, 1-4C-alkyl or 1-4C-alkoxy,

R20 is halogen, nitro, carboxyl, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,

R21 halogen, 1-4C-alkyl or 1-4C-alkoxy,

R22 halogen, nitro, carboxyl, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,

R23 halogen, 1-4C-alkyl or 1-4C-alkoxy,

R24 halogen, nitro, carboxyl, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,

R25 halogen, 1-4C-alkyl or 1-4C-alkoxy,

the salts of these compounds, as well as the N-oxides, enantiomers, E/Z isomers and tautomers of these compounds and their salts.

7. Compounds of formula 1 according to claim 1, in which

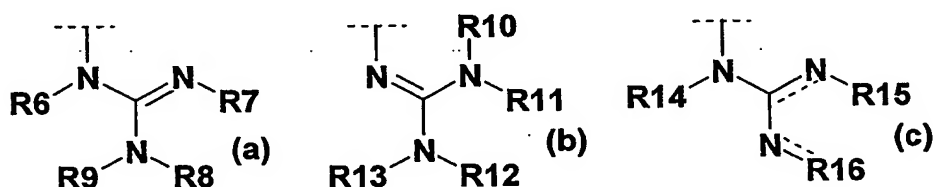
R1 is 1-4C-alkyl,

R2 is 1-4C-alkoxy, 3-6C-cycloalkoxy, 3-6C-cycloalkylmethoxy, or 1-4C-alkoxy which is completely or predominantly substituted by fluorine,

R3 is 1-4C-alkoxy, 3-6C-cycloalkoxy, 3-6C-cycloalkylmethoxy, or 1-4C-alkoxy which is completely or predominantly substituted by fluorine,

R4 is hydrogen, halogen, nitro, 1-4C-alkyl, trifluoromethyl or 1-4C-alkoxy,

R5 is a radical of the formulae (a), (b) or (c)



in which

if R5 is a radical of the formula (a),

either

R6 is hydrogen,

R7 is hydrogen, 1-4C-alkyl, 3-7C-cycloalkyl or 3-7C-cycloalkylmethyl, and

R8 and R9, together and including the nitrogen atom to which both are bonded, are a piperazin-1-yl radical substituted in 4-position by R17, a azocan-1-yl, azonan-1-yl, azecan-1-yl, tetrahydro-isoquinolin-2-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, 2,6-dimethyl-morpholin-4-yl or 2,6-dimethyl-piperidin-1-yl radical,

or

R6 is hydrogen,

R7 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl or 3-7C-cycloalkylmethyl,

R8 is hydrogen, 1-7C-alkyl, 3-7C-cycloalkyl or 3-7C-cycloalkylmethyl, and

R9 is Aryl1, naphthyl, phenyl, phenyl substituted by R18 and/or R19, phenyl-1-4C-alkyl or phenyl-1-4C-alkyl substituted in the phenyl moiety by R20 and/or R21,

in which

if R5 is a radical of the formula (b),

either

R10 and R11 independently of one another are hydrogen, 1-4C-alkyl, 3-7C-cycloalkyl or 3-7C-cycloalkylmethyl, and

R12 and R13, together and including the nitrogen atom to which both are bonded, are a piperazin-1-yl radical substituted in 4-position by R17, a azocan-1-yl, azonan-1-yl, azecan-1-yl, tetrahydroisoquinolin-2-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, 2,6-dimethyl-morpholin-4-yl or 2,6-dimethyl-piperidin-1-yl radical,

or

R10 and R11, together and including the nitrogen atom to which both are bonded, are a 2,6-dimethyl-morpholin-4-yl or 2,6-dimethyl-piperidin-1-yl radical, and

R12 and R13, together and including the nitrogen atom to which both are bonded, are a pyrrolidin-1-yl, piperidin-1-yl, hexahydroazepin-1-yl, morpholin-4-yl, 4-(1-4C-alkyl)-piperazin-1-yl, 2,6-dimethyl-morpholin-4-yl or 2,6-dimethyl-piperidin-1-yl radical,

in which

if R5 is a radical of the formula (c),

R14 is hydrogen, and

R15 and R16, together and with inclusion of the N-C(-)-N structure to which they are bonded are Aryl²,

Aryl¹ is 4-methylthiazol-2-yl, benzimidazol-2-yl, 5-nitrobenzimidazol-2-yl, 5-chlorobenzimidazol-2-yl, 5-methylbenzimidazol-2-yl, benzothiazol-2-yl or benzoxazol-2-yl,

Aryl² is 1-methyl-4-oxo-4,5-dihydro-1H-imidazol-2-yl, imidazol-2-yl, 4,5-dicyano-imidazol-2-yl, 4-methyl-imidazol-2-yl, 4-ethyl-benzimidazol-2-yl, 4-acetyl-imidazol-2-yl, 1H-[1,2,4]triazol-3-yl, benzimidazol-2-yl, 1-methyl-benzimidazol-2-yl, 1-ethyl-benzimidazol-2-yl, 5,6-dimethyl-benzimidazol-2-yl, purin-8-yl, 6-amino-7-methyl-7H-purine-8-yl, 1,6-dimethylimidazo[4,5-b]pyridin-2-yl, 1,5,6-trimethylimidazo[4,5-b]pyridin-2-yl, 1,3-dimethyl-3,7-dihydro-1H-purine-2,6-dione-8-yl, 7-ethyl-3-methyl-3,7-dihydro-purine-2,6-dione-8-yl, 1,3,7-trimethyl-3,7-dihydro-purine-2,6-dione-8-yl or 1H-[1,2,4]triazol-3-yl,

R17 is formyl, 1-4C-alkylcarbonyl, 2-hydroxyethyl, phenyl, phenyl substituted by R22 and/or R23, phenyl-1-4C-alkyl or phenyl-1-4C-alkyl substituted in the phenyl moiety by R24 and/or R25,

R18 is halogen, nitro, 1-4C-alkyl or 1-4C-alkoxy,

R19 is halogen, 1-4C-alkyl or 1-4C-alkoxy,

R20 is halogen, nitro, 1-4C-alkyl or 1-4C-alkoxy,

R21 is halogen, 1-4C-alkyl or 1-4C-alkoxy,

R22 is halogen, nitro, 1-4C-alkyl or 1-4C-alkoxy,

R23 is halogen, 1-4C-alkyl or 1-4C-alkoxy,

R24 is halogen, nitro, 1-4C-alkyl or 1-4C-alkoxy,

R25 is halogen, 1-4C-alkyl or 1-4C-alkoxy,

the salts of these compounds, as well as the enantiomers, E/Z isomers and tautomers of these compounds and their salts.

8. Compounds of formula 1 according to claim 1, in which

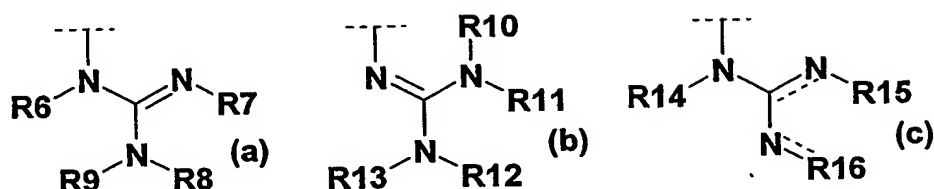
R1 is methyl,

R2 is 1-4C-alkoxy,

R3 is 1-4C-alkoxy,

R4 is hydrogen,

R5 is a radical of the formulae (a), (b) or (c)



in which

if R5 is a radical of the formula (a),

either

R6 is hydrogen,

R7 is hydrogen, and

R8 and R9, together and including the nitrogen atom to which both are bonded, are a piperazin-1-yl radical substituted in 4-position by R17, a tetrahydroisoquinolin-2-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, azocan-1-yl, azonan-1-yl or azecan-1-yl radical,

or

R6 is hydrogen,

R7 is hydrogen, and

R8 is hydrogen or 1-4C-alkyl, and

R9 is Aryl1, naphthyl or phenyl-1-2C-alkyl,

in which

if R5 is a radical of the formula (b),

R10 is hydrogen or 1-4C-alkyl,

R11 is hydrogen or 1-4C-alkyl, and

R12 and R13, together and including the nitrogen atom to which both are bonded, are a piperazin-1-yl radical substituted in 4-position by R17, a tetrahydroisoquinolin-2-yl, 3,5-dimethyl-pyrazol-1-yl, pyrazol-1-yl, azocan-1-yl, azonan-1-yl or azecan-1-yl radical,

in which

if R5 is a radical of the formula (c),

R14 is hydrogen, and

R15 and R16, together and with inclusion of the N-C(-)-N structure to which they are bonded are Aryl2,

Aryl1 is 4-methylthiazol-2-yl or benzothiazol-2-yl,

Aryl2 is 1-methyl-4-oxo-4,5-dihydro-1H-imidazol-2-yl, imidazol-2-yl, 4-methyl-imidazol-2-yl, 4-ethyl-benzimidazol-2-yl, 4-acetyl-imidazol-2-yl, benzimidazol-2-yl, 1-methyl-benzimidazol-2-yl, 1-ethyl-benzimidazol-2-yl or 5,6-dimethyl-benzimidazol-2-yl,

R17 is acetyl, 2-methoxyphenyl or benzyl,

the salts of these compounds, as well as the N-oxides, enantiomers, E/Z isomers and tautomers of these compounds and their salts.

9. Compounds of formula 1 according to claim 1, in which

R1 is methyl,

R2 is methoxy or ethoxy,

R3 is methoxy,

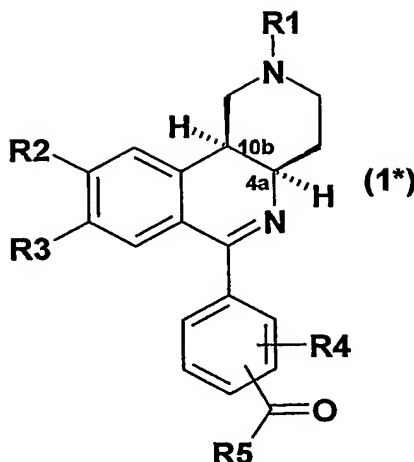
R4 is hydrogen,

R5 is N-(1-methyl-4-oxo-4,5-dihydro-1H-imidazol-2-yl)-amino, N-(1-amino-1-azocan-1-yl-methylene)-amino, N-[1-(4-acetylpiperazine-1-yl)-1-amino-methylene]-amino, N-(N'-(R)-1-phenylethyl)-guanidiny, N-(N'-(S)-1-phenylethyl)guanidiny, N-[1-amino-1-(4-benzylpiperazine-1-yl)-methylene]-amino, N-[1-amino-1-(2-methoxy-phenyl-piperazin-1-yl)-methylene]-amino, N-[1-(3,5-dimethyl-pyrazol-1-yl)-1-imino-methyl]-amino, N-(N'-naphthalene-1-yl)guanidiny, N-(N'-4-methylthiazol-2-yl)guanidiny or N-[1-(tetrahydroisoquinoline-2-yl)-1-imino-methyl]-amino,

the salts of these compounds, as well as the enantiomers, E/Z isomers and tautomers of these compounds and their salts.

10. Compounds of formula 1 according to claim 1, in which the hydrogen atoms in positions 4a and 10b are in the cis position relative to one another, the salts of these compounds, as well as the N-oxides, enantiomers, E/Z isomers and tautomers of these compounds and their salts.

11. Compounds of formula 1 according to claim 1 which have with respect to the positions 4a and 10b the configuration shown in formula (1*):



the salts of these compounds, as well as the N-oxides, enantiomers, E/Z isomers and tautomers of these compounds and their salts.

12. Compounds of formula 1 according to claim 1 for treating diseases.
13. A pharmaceutical composition comprising one or more compounds of formula 1 according to claim 1 together with customary pharmaceutical auxiliaries and/or excipients.
14. The use of compounds of formula 1 according to claim 1 for producing pharmaceutical compositions for treating respiratory disorders and/or dermatoses.
15. A method for treating an illness treatable by the administration of a PDE4 inhibitor in a patient comprising administering to said patient in need thereof a therapeutically effective amount of a compound of formula 1 according to claim 1.
16. A method for treating airway disorders and/or dermatoses in a patient comprising administering to said patient a therapeutically effective amount of a compound of formula 1 according to claim 1.